THROMBOLYTIC AGENTS IN UNSTABLE ANGINA

Unasem Collaborative Group, University Hospital Maastricht, The Netherlands.

We report the pilot phases of a multicentre trial. Patients with unstable angina were treated with streptokinase (21 patients), rt-PA (27 patients) or APSAC (35 patients). Very strict clinical and ECG inclusion criteria were used. Angiography was performed 11 hours (range 1 to 69 hours) after the last attack of chest pain. Subsequently, patients having coronary artery disease received therapy. Angiography was repeated the following day.
Results: 11 of 83 patients had normal coronary arteries. In 6 patients complete angiography was not available. Thrombus was found in half of the patients. After treatment, 31 of 66 patients had a decrease in stenosis of the culprit lesion. Angiographic improvement was more frequent in (nearly) occluded coronary arteries (25/36 patients) than in non-occluded coronary arteries (6/30 pts). These findings were confirmed by quantitative measurements. After treatment 67% of patients had cardiac events: 13 Patients suffered from a myocardial infarction, 35 patients underwent PTCA or CABG. One patient died during the three months follow-up period. No relation was found between the angiographic result and clinical outcome.
Conclusions: 1) Unstable angina patients have a high incidence of thrombosis; 2) after thrombolysis perfusion can improve especially in (nearly) occluded coronary arteries; 3) In spite of thrombolysis cardiac events are common in this patient population 4) Clinical outcome can not be predicted by angiography. A large double blind randomized trial (APSAC vs placebo) is presently underway.

UTILITY OF ACTIVATED CLOTTING TIME IN SHEATH REMOVAL FOLLOWING PTCA

Howard S. Bush, M.D., Jose Garcia, M.D., Michael G. Avedissian, M.D., Eugene S. Killeavy, M.D., Kathy G. Dougherty, C.R.T.T., James J. Ferguson, M.D., F.A.C.C. St. Luke's Episcopal Hospital, Texas Heart Institute, Baylor College of Medicine, Houston, Texas.

With the use of full anticoagulation during interventional cardiovascular procedures, vascular sheaths are frequently removed outside the cath lab. We examined the utility of the activated clotting time (ACT) in determining the optimal time for sheath removal and avoiding bleeding complications. ACTs and simultaneous partial thromboplastin times (PTTs) were drawn periodically in the recovery area and vascular sheaths were removed when the ACT was below 190 sec. The compression time of the femoral artery site was recorded. None of the 46 pts required greater than 20 minutes of arterial compression time following sheath removal. There were no thrombotic or bleeding complications. There was no difference in holding time between 36 pts with a normal PTT (< 1.1 x control) and 10 pts with a therapeutic PTT (> 2 x control).

	PTT(sec)	ACT(sec)	hold time (min)
normal (N=36)	30±7	128±16	12±3
therapeutic (N=10)	63±20*	161±16*	13±3

*p < 0.001

Conclusions: ACT provides a quick and reliable method in determining when vascular sheaths can be safely removed, even in the face of a therapeutic PTT.

LONGTERM HEMODYNAMIC BENEFIT OF THROMBOLYTIC THERAPY IN PULMONARY EMBOLIC DISEASE.

G.V.R.K. Sharma, M.D., E.D. Folland, M.D., K.M. McIntyre, M.D. and A.A. Sasahara, M.D. VAMC, West Roxbury and Harvard Medical School, Boston, MA.

We randomized 23 patients (pts) with no prior cardiopulmonary disease and with angiographically proven acute pulmonary embolism to Heparin (H) therapy (n=11) or thrombolytic (T) therapy with streptokinase or urokinase (n=12), followed by H. After follow up (F/U) for a mean duration of 7 years, they underwent a right heart catheterization. Hemodynamic measurements included mean right atrial (RA), pulmonary artery (PA) and pulmonary capillary wedge (PCW) pressures, cardiac index and pulmonary vascular resistance (PVR) at rest (R) and supine leg exercise (E). Mean results at F/U compared to baseline (pre- and 24 hr post-therapy) hemodynamic data were:

	H				T			
	Baseline		F/U		Baseline		F/U	
	Pre-Rx	Post-Rx	R	E	Pre-Rx	Post-Rx	R	E
HR	102	90	74	112	86	92	78	118
RA	5	3	2	7	6	4	4	3
PA	26	24	22*	32*	28	20	16#	19#
PCW	9	7	8	6	12	10	9	8
CI	3.5	3.7	3.2	4.7	3.3	3.9	3.4	4.9
PVR	388	370	350**	443**	355	216	174@	180@

*,**p<0.05 #,@p=n.s.

H pts unlike T pts have persistently elevated resting PA that increases with E. PVR is commensurately higher with H, but normal with T. Conclusion: T unlike H, maintains the longterm pulmonary vascular response to E at a normal level by virtue of its more complete resolution of emboli during the acute phase.

ULTRASONIC DISSOLUTION OF HUMAN THROMBI

Jang-Seong Chae, M.D., Aaron S. Hong, B.A., Stuart Dubin, M.D., Ph.D., Stephen Lee, M.D., Michael C. Fishbein, M.D., F.A.C.C., Robert J. Siegel, M.D., F.A.C.C. Cedars-Sinai Medical Center, Los Angeles, CA.

To evaluate ultrasound for lysis of thrombi, we studied 50 human blood clots in vitro weighing 1.1±0.2g, 1, 2, 3, 4 and 7 days old. In addition 6 cell free fibrin clots were studied to assess the mechanism of thrombus dissolution. Ultrasonic energy at a frequency of 20 kHz at 50W via a ball tipped 0.030 in. wire probe was applied to clots in plastic tubes with saline. Probe lengths of 31, 56 and 105 cm resulted in differing rates of clot dissolution (15±1, 65±93 and 168±93 sec respectively; r=0.99). Using the 56 cm probe, age did not affect rate of clot dissolution (60±19 sec). The size of particles after dissolution was assessed for both whole blood and cell free fibrin clots. The measured particle diameters for whole blood ranged from 2.4 to 242um (99% <20um) and for fibrin clot was 2.4 to 48um (99% <20um). Particle size was similar with or without streptokinase (SK) 75,000u. Cell free fibrin clot dissolution with SK thrombolysis showed significantly higher levels of D-Dimers (8,000-32,000ng/ml) as compared with those with ultrasound clot lysis (250-2,000ng/ml).
Conclusion: An ultrasound probe rapidly dissolves clots, generates particles that are ≤ those seen after SK administration, and does not activate the fibrinolytic cascade. Lysis is faster with shorter probes, but not related to clot age. Ultrasound energy delivered by wire probes has potential for lysing thrombotic occlusions.